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ABSTRACT

The history of cooperative learning at the elementary level is well documented. The research and utilization of cooperative learning at the secondary level is limited. This research aims to contribute to the literature on cooperative learning, especially Jigsaw II, at the secondary level. The research also represents a continuation of research conducted on Jigsaw II and III, subsequently leading to the development of Jigsaw IV as a cooperative learning strategy. Subjects in all three researches were 100 ninth-grade geography students at an inner city school situated in a gulf coast state. Findings suggest that Jigsaw IV answered the concerns of students and teachers using Jigsaw II and had a positive impact on the students' academic achievement. Contains a table of data and 10 references. Appendixes contain a unit lesson plan, a six-day plan, expert sheets, and a sample student survey. (Author/BT)

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The Development of Jigsaw IV in a Secondary Social Studies Classroom

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Abstract

The history of the cooperative learning at the elementary level is well documented. The research and utilization of cooperative learning at the secondary level is limited. The purpose of this research was to contribute to the literature on cooperative learning, especially Jigsaw II, at the secondary level. This publication also represents a continuation of research conducted on Jigsaw II, subsequently leading to the development of Jigsaw IV as a cooperative learning strategy. The results suggest that Jigsaw IV answered the concerns of students and teachers using Jigsaw II and had a positive impact on the student's academic achievement.

Key Words: Cooperative Learning, Jigsaw II, Social Studies, Jigsaw III, Jigsaw IV.

The Development of Jigsaw IV in a Secondary Social Studies Classroom

The effects of cooperative learning on children's learning of social studies at the elementary level are well documented (Slavin, 1994). Such is not the case at the secondary level. As of 1995, only 21 research articles have reported the effects of cooperative learning on the attainment of social studies principles at the secondary level. The need for continued research on cooperative learning at the secondary level is painfully apparent. The inadequacy of the research on the effects of the cooperative learning strategy Jigsaw II on secondary social studies students' academic success is further demonstrated in the research of the literature on cooperative learning and social studies by Newman and Thompson (1987). Their research revealed several concerns that need to be addressed.

One of the major concerns addressed by Newman and Thompson in their research focused on the lack of cooperative learning being researched at the secondary social studies in particular. Only one research project could be documented in their 1987 mega-study that had any relationship to secondary social studies. The need became even more apparent during the research for a doctoral dissertation confirmed the lack of research in this area (Holliday, 1995). If cooperative learning is so well researched at the elementary level (Slavin, 1994), and its proponents preach the excellence of cooperative learning as a tool for teachers to use in the classroom to enhance their students' academic achievement (Slavin, 1995; Johnson, Johnson & Holubec, 1994), the question that must be raised is "Why hasn't the research been conducted?"

There are few teachers willing to employ cooperative learning at the secondary level and the study of effective learning at the high school level is weakest (Newman & Thompson, 1987). Therefore, the purpose of this current research was to add to the research and literature on cooperative learning at the secondary level. There are a number of strategies available, in cooperative learning, to the teacher/practitioner that could enhance learning at the secondary level but the one that will be addressed here will be the improvement of the cooperative learning strategy Jigsaw II.

Cooperative learning classrooms have students who are more attentive, more task oriented and who retain knowledge for longer periods of time based on the research of the following: David Johnson, Richard Johnson, Edith Holubec, Robert Slavin, R.M. Mattingly, Robert Van Sickle, F.M. Newman, J. Thompson, Norman Davidson and T.C. Worsham. There are five basic elements that separate cooperative learning from group learning. Successful cooperative learning strategies will focus on these five principles: a) face to face interaction; b) positive interdependence of goals, roles, and learning outcomes; c) individual assessment and accountability; d) socialization and group skills and e) self and peer evaluation for group processing (Johnson, Johnson & Holubec, 1994; Slavin, 1994). Teachers who implement group work without these principles are not using cooperative learning. Teachers who implement these principles and mix their groups heterogeneously (between high, middle and low achievers) will find themselves successful in their group work (Slavin, 1987). Through strict observance of these principles and mixture of students, grades of high achiever grades will not be affected by the grades of lower achieving student's grades, but just the opposite will occur (Slavin, 1990). The grades of lower and middle-achieving

students will be more than likely improved (Slavin, 1994; Johnson, Johnson, & Holubec, 1994). The grades of higher achieving students are not affected by lower achiever grades because of individual accountability. Face to face interaction assures that students will be forced to work together toward some common goal creating a true group project or outcome. However, despite the concern of parents and honor students no group grade will be entered into a grade book for individual student grade. Individual accountability assures students that their grades are the ones that are recorded in the grade book. However, several concerns not addressed by the other requirements for cooperative learning will be addressed.

The strategy that is recommended most for social studies is the Jigsaw series (Slavin, 1990). The rationale behind this strategy is that in social studies there may not always be one answer to a question. Other strategies (such as STAD and TGT) usually are looking for only one correct answer and are therefore best suited to the math and sciences. There are currently three types of Jigsaw strategies available for teachers to use in their classroom: a) Jigsaw developed by E. Aronson (and others, 1978); b) Jigsaw II developed by R.E. Slavin in1977; and c) Jigsaw III developed by R Stahl in1994. Jigsaw and Jigsaw II differ only in the fact that team competition is allowed in Jigsaw II. The basic parts of the strategies are the same. Both have the students divided into groups and then into teams. The teacher gives questions for the students to answer. The students leave their group and go to their team to answer the expert sheets or questions. They then return to their group with their expert sheets (Slavin, 1994; Appendix C) answered and teach each other their respective expert sheets. Then they are tested on the material. In Jigsaw II the grades are averaged and the team with the best average score is rewarded.

This aspect of competition is the focal point of Jigsaw II. Jigsaw III developed by Stahl in 1994 adds a whole group review process before the test but then follows Jigsaw II for the competition element.

In research conducted as part of a doctoral dissertation (Holliday, 1995) the author identified several concerns that need to be addressed in any future research on the cooperative learning strategy Jigsaw II. The1995 research utilized post research surveys, observations, and post treatment interviewing of teachers and students. The data gathered identified the following concerns: a) Response accuracy (i.e. students were concerned if they had the correct answers to the expert group questions); b) Contributor responsibility (i.e. students and teachers were concerned about some students not doing any work or one student doing all the work); and c) Lack of knowledge (i.e., teachers were concern with information not learned). A 1997 follow-up study addressed one of the concerns by using Jigsaw III, as designed by Stahl (1994). Jigsaw III addressed the group review prior to the exam that was not present in the 1995 study. This however, did not address the concerns of the students and teachers that were still present from the 1995 study. This led to a need for some further evaluation of the remaining concerns.

In a 1998 study of the initial research on Jigsaw II and Jigsaw III (see Table I) Day One was added to the process where the lesson was introduced to the class in a whole group format. During this process the teacher introduced the topic to the class via lecture, film, discussion, or brainstorming. After initially introducing the lesson, the teacher assigned students to expert groups and gave each group expert questions to answer (Slavin, 1994). Once the students answered the expert questions (in their expert groups) they then regrouped into their home teams to teach each member of the team

their respective questions. However, prior to this teaching each other a quiz was administered to the expert groups to check for accuracy. Day one was in direct response to teacher interviews after the 1995 that there was no provision for introducing the lesson to the students prior to teaching as prescribed by research for effective teaching (Slavin, 1987).

In Day Two (identical to Jigsaw II), students continued to work on expert questions prior to their going back to their home teams or groups to share their information with the other members of their home team (groups students are originally assigned to before going to their expert groups).

Table 1
Comparisons of Jigsaws

JIGSAW II	JIDSAW III	JIGSAW IV
1.		Introduction
2. Expert sheets assigned to expert groups	Same as II	Same as II
3. Groups answer expert questions prior to returning to home teams	Same as II	Same as II
4.		Quiz on material in the expert groups checking for accuracy
5. Students return to Home Teams sharing their information with team mates	Same as II	Same as II
6.		Quiz on material shared checking for accuracy
7.	Review process Whole group by Jeopardy, Or Quiz Bowl, etc.	Same as III
8. Individual	Same as II	Same as II

Assessment
And grade

9.

Re-teach any material missed on assessment as needed

On Day Three (all three Jigsaws are the same), students answered the expert questions in their expert group in order to have the information to share with their teammates. This is the same procedure for Jigsaw II and III. On Day Four, prior to going to home team, the teacher administered a review quiz to monitor the accuracy of student answers. This step is added to Jigsaw IV in an effort to address one of the issues the students had concerning the accuracy of information being taught to their teammates. On Day Five the sharing was the same, for all three Jigsaws. Here each member taught the other members of their team the information gathered in their expert groups. The teacher administered a second quiz, again to check for accuracy, on Day Six. On Day Seven, Jigsaw III and IV differ from Jigsaw II by the addition of a review session prior to the individual assessment. Here "Jeopardy", "Quiz Bowl," or some other form of a whole class review game was used to review the information in preparation for assessment. On Day Eight all three Jigsaws included administration of some form of an individual assessment based on the lesson or lessons. Day Nine included a teacher-directed review of the information missed on the test to determine if there was any material missed by the majority of the class that needed a further look.

DESIGN OF THE STUDY

The present study employed the design of the previous three studies, as this research was part of a three-year study based on cooperative learning at the secondary level. A pre-test and post-test was administered to the subjects, as well as conducting

several student and teacher interviews prior to, during and after the study. A post study survey was administered to the students to measure their reaction to the study. The unit plan, the six-day lesson plan, expert sheets, and the results of survey can be found in appendices.

Students were assigned to Jigsaw groups based on achievement level and gender. They were taught on the importance of the five requirements for cooperative learning and how these differed from group learning. The students were also taught on how to employ the group skills needed to be successful in their groups (respecting others opinions, everyone contributing to the final product, and especially bringing accurate information to the group). Each group member was to evaluate each other as to their performance within the group. Their peers, thus affecting the results of their assessment performance, excluded those students who chose not to contribute to the group effort. The teacher evaluated each group and group member as to their participation within the group based on the work of Slavin (1994). The six-day plan was used to implement the changes to Jigsaw and the students were tested at the end of the unit.

SUBJECTS AND MATERIALS

The subjects in all three researches were of 100 ninth grade (in each attempt) geography students at an inner city school situated in a state on the gulf coast of the United States. The text used in each study was the same throughout. The same content area of unit instruction (Africa South of the Sahara) was used throughout the research. A copy of the goal, objectives, expert sheets, and six-day plan can be found in the

appendices. The only uncontrolled element during the three attempts was that the students changed each year.

The home teams were divided between one high achiever, two middle achievers and one low achiever. These students were mixed heterogeneously by gender and race.

FINDINGS

The first and second studies verified the research of Slavin (1994), Johnson, Johnson & Holubec (1994) and others in cooperative learning that students a) will develop social and group skills in a cooperative classroom; b) can succeed in groups academically (high achieving students are not penalized by low achieving student scores); and c) learn to take responsibility for their own learning. However, from the perspective of the students and teachers several concerns were identified from the surveys and interviews conducted during the study. The first student concern identified was whether the information "taught" by their teammates or group members was accurate or "what the teacher was looking for." The second student concern was what if a peer did not do the work or expected one person to do all the work. This is a concern that many of the high achievers expressed: "I am the only one who seems to always do works in our group". The teacher's major concern was how to introduce a cooperative learning lesson or unit and "how do I assure that all the students are learning". These are the concerns that were the focus of the third part of this study.

Student's academics achievement (a major concern for teachers) and whether or not cooperative learning benefited it was addressed in the third study. This study identified an area of concern in academic success with the 100 subjects studied. The pre-

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study failure rate was about 30% of the ninth graders. At the conclusion of the third study and implementing Jigsaw IV the failure rate dropped to less than ten percent. The control group classes, taught by the usual methods (lecture, map sheets, worksheets and reports) maintained their usual failure rate of about 30%. The students who failed did so due to excessive absenteeism or failure to do any work at all. High achievers' grades were not affected by the lower achieving students' grades but the scores of lower achieving students did rise because of the cooperative learning strategy. The post-test administered at the conclusion of the study was the same assessment instrument that was administered to the subjects as a pre-test. Therefore it is safe to assume that the difference in scores achieved on the posttest between the two groups represents the difference in what learned (based on successful scoring of 75% on the assessment).

The Attitudinal Survey (Appendix D) was used to measure the students' like or dislike for cooperative learning as a teaching tool. The majority of the students felt they learned more and were more attentive in cooperative learning than in their classes taught by more traditional methods.

The interviews conducted during and after the study were the most revealing aspect of the study. Students at first resisted the lesson and cooperative learning in the studies but eventually were won over by the end of the study. Students involved in the study were interviewed once before and once after the studies. The answers varied from student to student on the questions asked. At first students made comments like: " I don't want to be on his or her team; they're stupid". Some expressed concern for the correctness of the answer they were given. However some of the responses were positive like: "I like

this way of teaching, it's more fun." "The other way of teaching was too boring." Some of the responses were concerned with other students copying their work as their own.

These interviews and survey responses created a need for a strategy that would address these concerns. In Jigsaw IV (Table 1) the teacher introduced the lesson in a way that was user friendly; one, that the teacher felt comfortable utilizing in the classroom. The two quizzes addressed the issue of accuracy of answers that the students received from their peers. The teacher also could judge whether the students were on "the same wavelength" by correcting the information before it was taught to their teammates. The whole group review before the test allowed for another accuracy check prior to the assessment. The final stage addressed the concern that dealt with mastery of the knowledge. The re-teaching allowed teachers to continuously check for student understanding and mastery.

There were findings that were identified in the studies that were not part of the actual planning. These unplanned occurrences that were identified as part of the findings were positive in nature and reflective on the value of cooperative learning. It was found that students were more attentive in class (fewer people fell asleep or were off task) because their peers would not let them "slack off". Absenteeism declined because in order to receive answers, a student had to be able to give answers and teach their parts. This required that students be at school and functioning in the groups. The most positive of the unplanned affects of Jigsaw IV was that student's learned to trust and respect each other as people. Students were heard to say about their classmates or teammates " I did not know he/she was that smart." "I didn't like so and so before but they are really cool." Their attitudes towards each improved across the board.

CONCLUSION

The outcome of this research and the development of Jigsaw IV saw student's academic achievements and classroom demeanors improve. Jigsaw IV addresses those concerns of the students and teachers who have utilized the cooperative learning strategy Jigsaw II. Classroom management was enhanced because peer pressure did not allow fellow students to enter the groups without pulling their weight or sharing the load (Holliday, 1995). Students were not allowed to seek teacher assistance until they had exhausted all their teammates' knowledge and other resources on the subject (thus becoming responsible for their learning). The teacher no longer was the sole possessors of knowledge, but the facilitators of their students' learning. This interdependency forced teammates to bring something to the table; teammates no longer just receive information, but must also provide it. The use of cooperative learning and especially Jigsaw IV allows teachers to offer their students an effective way of learning those skills needed to be a functional citizen in a global community. This may not be a cure all for that goes wrong in today's classroom, but it is another tool that teachers can utilize in their classroom to help create a learning environment.

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Appendix A

Unit Lesson Plan

GOAL: Students will be able to utilize the Five Themes of Geography and the National Standards as they apply geography to everyday life skills.

OBJECTIVES: 1. While in cooperative learning groups, students will master the National Geographic Standards.

2. While in cooperative learning groups, students will develop group processing skills needed to be good citizens.

3. While in cooperative learning groups, students will take responsibility for their own learning in order to master the material from the unit.

ASSESSMENT: While using the Cooperative Learning Strategy Jigsaw IV students will be able to complete a Unit Exam with 75% mastery.

Appendix B

Six Day Plan

Based on Block Schedule (97 minutes)

DAY	ACTIVITY	TIME
Day One:	Introduce the students to unit by film, lecture, or CD-ROM	
	A) Students will brainstorm about what they know and what they want to know about unit after introduction.	45 minutes
	B) Hand out expert sheets to students (explaining to students their role) assigning letter "A" through "E".	45 minutes
Day Two:	A) Students move into expert groups to answer questions on respective expert sheets using text and individual atlases.	60 minutes
	B) Students report to home team to complete map exercise	20 minutes
	C) Quiz given to each expert group based on their expert sheet to check for accuracy.	10 minutes
Day Three:	A) Students return to their home teams to teach each other their respective expert sheets.	60 minutes
	B) Quiz given to whole class to check accuracy of expert sheet answers.	30 minutes
Day Four:	A) Whole class review using either a quiz bowl format or Jeopardy formats. The teams vie for bonus points.	60 minutes
	B) Clarify any misinformation found during review.	30 minutes
Day Five:	A) Individual assessment--Unit Exam	60 minutes
	B) Grade exams	30 minutes
Day Six:	A) Re-teach any material not mastered by students as derived from exam and as needed (concentrating on concepts) using tutorial CD-ROM or other technology available to class.	90 minutes

Appendix C

EXPERT SHEET

"A"

Movement

1) How are people, goods, and services transported in this unit? What environmental impact does this place have on movement? What hinders the free movement of people and goods?

2) Give examples of how humans have overcome movement obstacles? What movement issues have caused these human adaptations?

3) Have these adaptations created other problems for humans?

Expert Sheet

"B"

Location

1) Where is this place located? What is its absolute location? What is its relative location? What is meant by its world address?

2) How does this place's location affect humanity? How does it affect its economy?

3) What problems exist because of its location? How does location affect its international relations?

Expert Sheet

"C"

Region

1) What makes this place similar to other areas in the region? What makes this place different than other places in the region?

2) What is a formal region? What is a functional region? Give examples of each.

3) What links a region together?

Expert Sheet

"D"

Human Environmental Interaction

1) How have people changed this place? What are the consequences of these changes?

2) How have people responded to these changes? Give examples of the changes.

3) Give examples of those helpful changes. Give examples of harmful changes. What is the impact on the future of both of these types of changes?

Expert Sheet

"E"

Place

1) What are the physical characteristics of this place? What are the criteria for physical characteristics?

2) What are the characteristics of the people? What are the criteria for human characteristics?

3) How do these characteristics affect this place?

Appendix D

Student Responses to Survey

1) I learned more geography in small cooperative groups than in a regular classroom setting.

Strongly Agree 28% Agree 43% No Opinion 7% Disagree 17%

Strongly Disagree 5%

2) I enjoyed working with other students in small cooperative groups more than I would have enjoyed working by myself.

Strongly Agree 40% Agree 33% No Opinion 16% Disagree 22%

Strongly Disagree 3%

3) The small group cooperative activities allowed me to review better to score higher on the geography test.

Strongly Agree 28% Agree 28% No Opinion 29% Disagree 10%

Strongly Disagree 5%

4) I felt my teammates and I learned from one another other.

Strongly Agree 19% Agree 40% No Opinion 21% Disagree 16%

Strongly Disagree 4%

5) I thought the competition between groups and rewards given during the class were appropriate.

Strongly Agree 59% Agree 31% No Opinion 9% Disagree 1%

Strongly Disagree 0%

6) I would like to see small cooperative learning groups used in more of my classes.

Strongly Agree 46% Agree 37% No Opinion 9% Disagree 6%

Strongly Disagree 2%

7) I thought using small cooperative groups made geography boring.

Strongly Agree 2% Agree 2% No Opinion 6% Disagree 41%

Strongly Disagree 49%

8) I believe I was taken advantage of by being in small groups because others in my group expected me to do the work.

Strongly Agree 18% Agree 8% No Opinion 23% Disagree 26%

Strongly Disagree 25%

9) My opinion of some of my classmates changed in a positive manner because of the small cooperative groups in which I participated.

Strongly Agree 18% Agree 26% No Opinion 29% Disagree 17%

Strongly Disagree 10%

10) I learned to work better with students of other races in the small cooperative groups.

Strongly Agree 32% Agree 33% No Opinion 23% Disagree 12%

Strongly Disagree 0%

11) I liked the way my geography teacher taught the course, using small cooperative groups, better than the way my other classes were taught.

Strongly Agree 60% Agree 26% No Opinion 7% Disagree 7%

Strongly Disagree 0%

12) I thought small cooperative groups were too noisy during class.

Strongly Agree 0% Agree 14% No Opinion 27% Disagree 32%

Strongly Disagree 27%

13) I learned more geography material because I was responsible for teaching my teammates.

Strongly Agree 21% Agree 20% No Opinion 30% Disagree 25%

Strongly Disagree 4%

14) I had fun in small cooperative groups because of the review games used.

Strongly Agree 54% Agree 36 No Opinion 8% Disagree 2%

Strongly Disagree 0%